

Listing of the Claims:

1. (Previously presented) A bipolar battery cell comprising:
a plurality of electric cells, each electric cell comprising:
a bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on another surface;
an electrolyte layer that exchanges ions between the positive-electrode layer and the negative electrode layer; and
a discharge circuit provided within each electric cell that electrically balances charged conditions of adjacent bipolar electrodes.
2. (Original) The bipolar battery cell of claim 1, wherein the discharge circuit is provided on the same surface of at least one layer of the positive-electrode layers, the negative-electrode layers, or the electrolyte layers.
3. (Previously presented) The bipolar battery cell of claim 1, further comprising a contact area between the discharge circuit and an adjacent bipolar electrode that is more than 0.06 mm^2 per battery capacity of the bipolar battery 1 Ah.
4. (Previously presented) The bipolar battery cell of claim 1, wherein a threshold of a discharge voltage in the discharge circuit is set between $3.6 \text{ V} - 4.1 \text{ V}$, and wherein a doping concentration is set between $10^{17} - 10^{18} \text{ cm}^{-3}$, and the thickness of a depletion layer is set between $0.1 \text{ }\mu\text{m} - 1.0 \text{ }\mu\text{m}$ so as to set a breakdown voltage of a PN junction of the discharge circuit the same as to the threshold.
5. (Original) The bipolar battery cell of claim 1, wherein the discharge circuit includes a zener diode layer.

6. (Original) The bipolar battery cell of claim 1, wherein the discharge circuit includes a luminescent device.

7. (Original) The bipolar battery cell of claim 6, further comprising a light guiding device arranged between the luminescent device and an end of the battery cell.

8. (Original) The bipolar battery cell of claim 6, further comprising a light sensor that responds to light emitted from the relevant luminescent device.

9. (Original) The bipolar battery cell of claim 8, wherein the discharge circuit includes a constant current circuit.

10. (Original) The bipolar battery cell of claim 9, further comprising a sheathing material that covers and seals the bipolar electrodes, the electrolyte layers, the discharge circuit, and the light sensor.

11. (Original) The bipolar battery cell of claim 1, further comprising a sheathing material that covers and seals the bipolar electrodes, the electrolyte layers, and the discharge circuit.

12. (Original) The bipolar battery cell of claim 1, further comprising a conductive sealing material.

13. (Previously presented) An assembled battery comprising a plurality of bipolar battery cells, wherein each bipolar battery cell comprises: a plurality of electric cells, each having

a laminated bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on another surface;

an electrolyte layer that exchanges ions between the positive-electrode layer and the negative electrode layer; and

a discharge circuit that electrically balances charged conditions of adjacent bipolar electrodes, wherein the discharge circuit is provided on the same surface of at least one layer of the positive-electrode layers, the negative-electrode layers, or the electrolyte layers.

14. (Previously presented) A vehicle comprising:

a controller; and

an assembled bipolar battery comprising a plurality of bipolar battery cells, wherein each bipolar battery cell comprises a plurality of electric cells, each having

a bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on another surface;

an electrolyte layer that exchanges ions between the positive-electrode layer and the negative electrode layer; and

a discharge circuit that electrically balances charged conditions of adjacent bipolar electrodes, wherein the discharge circuit is provided on the same surface of at least one layer of the positive-electrode layers, the negative-electrode layers, or the electrolyte layers.

15. (Previously presented) A method of forming a bipolar battery cell, each bipolar battery cell comprising a plurality of electric cells, the method comprising:

laminating a bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on another surface, with an electrolyte layer that exchanges ions between the positive-electrode layer and the negative electrode layer and a discharge circuit that electrically balances charged conditions of adjacent bipolar electrodes to form each electric cell of the plurality of electric cells.

16. (Original) The method of claim 15 wherein the discharge circuit is provided on the same surface of at least one layer of the positive-electrode layers, the negative-electrode layers, or the electrolyte layers.

17. (Previously presented) A bipolar battery cell comprising:
a plurality of electric cells, each electric cell comprising:
a bipolar electrode including a collector having a positive-electrode layer on one surface and a negative-electrode layer on another surface;
means for exchanging ions between the positive-electrode layer and the negative electrode layer; and
means for balancing the bipolar battery cell by electrically balancing charged conditions of adjacent bipolar electrodes.

18. (Previously presented) The bipolar battery cell of claim 1, wherein the discharge circuit comprises an abnormal voltage detecting circuit and a voltage balancing circuit.